OUR BOOK SHELF.

Minerals and Metals: a Reference-book [of] Useful Data and Tables of Information. A condensed compilation from various sources by J. G. Goesel. Pp. xiii+287. (New York: John Wiley and Sons; London: Chapman and Hall, Ltd., 1906.) Price 12*s.* 6*d.* net.

THE scope of this pocket-book of reference may be best indicated by quoting from the title-page:—"Legal, customary, and scientific measurements; geological classification; rock composition; chemistry, dry and wet assay; mineralogy; metallurgy; metal founding and plating; hydraulics; water purification; mineral oils; gases; explosives; strength of materials, including woods, their properties, adaptability, and preservation; pigments, gums, and solvents for paints and varnishes; miscellaneous data and receipts." It will thus be seen that the variety of subjects treated is much more extensive than is indicated by the main title, "Minerals and Metals"; in fact, there is, in a handy form, a vast amount of information which may be of use to mining engineers and others.

Books of this kind should, of course, be free from ambiguities and errors, but in the portions which we have specially tested, namely, those dealing with minerals and precious stones, numerous errors have been detected; quite extraordinary chemical formulæ are given for even common minerals, whilst in the spelling of names there are many misprints.

The book is clearly printed, though not on thin paper, and is well bound in limp leather, with rounded corners and gilt edges.

Practical Exercises in Chemistry. By G. C. Donington, Senior Science Master in the Leeds Grammar School. Pp. x+251. (London: Macmillan and Co., Ltd., 1906.) Price 2*s.* 6*d.*

MR. DONINGTON'S little book derives special interest from the fact that whilst he is a pupil, and a very grateful one, of Prof. Armstrong, he has found himself compelled by experience as a science master in a school (and one in which no specially unfavourable conditions prevail) to depart from the practice of leaving the pupils without a text-book during their practical lessons. This experience is, we believe, by no means uncommon, and it is an advantage that the "felt want" should be supplied by one who naturally strives to conserve as much as he can of the merits of the no text-book system. In this object the author has, we think, had good success, and his book is likely to take high rank among those which of late years have been written to set forth an elementary course of chemistry for those secondary schools where there is a desire to teach scientific method through the medium of this science.

Paradoxes of Nature and Science. By Dr. W. Hampson. Pp. xv+304. (London: Cassell and Co., Ltd., 1906.) Price 6*s.*

DR. HAMPSON proposes to explain to the uninitiated certain scientific "paradoxes." The only possible "explanation" of such paradoxes is attained by showing that the abnormal phenomena are determined by precisely the same laws as the normal phenomena; to "explain" why a balloon rises it is necessary to propound the general principles of gravitational mechanics and to show that it rises for the same reason as a stone falls. But Dr. Hampson eschews general principles. His "explanations" are appeals to prejudices as unscientific as those which gave rise to the appearance of a paradox. Even when his arguments are sound they must convey to a reader a wholly untrue idea of scientific method.

But they are not always sound. Sometimes he wanders far out of his depth, as, for instance, when he seeks to solve the old logical contradiction of Achilles and the tortoise by a reference to the atomic structure of matter. He would have done well to restrain his jeers at mathematicians until he had gained some acquaintance with the elements of their science.

Seasonal Botany, a Supplementary Text-book. By M. O'Brien Harris. Pp. 56. (London: Blackie and Son, Ltd., 1906.) Price 8*d.*

PROBABLY most teaching botanists looking back upon their early experiences when they first found it necessary to draft a syllabus of instruction can recall an attempt to prepare a course adapted to the round of the seasons. In the case of pure observational study such a course is profitable, but it is the general experience that a seasonal adjustment does not accord with the best morphological or physiological sequence, and this opinion is not modified by the arguments or scheme put forward in the present instance.

The seasonal syllabus given in the form of a tabulated scheme, and a number of physiological experiments on very usual lines, form the chief contents of the book.

French Readings in Science. Selections from Scientific and Technical Writers, arranged and edited for the Use of Students. By de V. Payen-Payne. Pp. vii+230. (London: Blackie and Son, Ltd., 1906.) Price 3*s.* 6*d.*

IGNORANCE of either French or German is a serious handicap to the scientific worker. University examining bodies are recognising this need, and some, such as the University of London, demand from candidates for science degrees a knowledge of these languages sufficient to enable them to translate with fair ease and accuracy. In making his selection of passages from scientific treatises, Mr. de Payen-Payne has included some extracts for their modernity, and others because of their association with great names in science. The compiler is catholic in his tastes, and his work should provide students with just the practice they require.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

Radium and Geology.

THOSE interested in this subject should refer to the paper which appears in the last issue of the *Philosophical Magazine*, by Mr. A. S. Eve, on the ionisation of the atmosphere over the ocean. Mr. Eve cites observations, and adds others of his own, showing that the ionisation over the ocean is much the same as over the land, and points out the difficulty of explaining this in view of the small content of radium in sea-water compared with that in ordinary rocks. Possessed as I am with the view that extra-terrestrial radio-active dust reaching the earth may account for much of the radium of soils, sediments, and rocks, I cannot but think that Mr. Eve's difficulty may find explanation in an extra-terrestrial source of supply.

Mr. Eve also gives some new determinations of the radium in sea-water, and arrives at results which considerably accentuate the discrepancy which I referred to

© 1907 Nature Publishing Group

in my letter written on January 6 (NATURE, January 24, p. 294). On his results, a normal river supply of the supposed uranium would in 90,000 years suffice to give the ocean its present radio-activity. In short, practically the whole of the uranium has to be accounted for in the sediments. Mr. Eve perceived the difficulty, and suggests that the sediments are, indeed, its destination. I have already referred to the difficulties attending this view.

Prof. Sollas's contention (p. 319) as to the probable original character of the uranium in zircon is, I think, unanswerable. I had this fully in view when referring to uranium-bearing minerals in certain rocks. In certain rock masses the zircon might be the chief or entire source of radium, but it would appear that this cannot possibly be the case with ordinary granites. The analysis made by Mr. Strutt of a Cornish granite showed that less than one-ninth only could in this case be so accounted for. Mr. Strutt directs attention to this. Again, Prof. Sollas shows by the analysis he cites that this granite was probably unusually rich in zircon. In Mr. Clarke's last report of analytical work done in the laboratory of the United States Geological Survey (Bulletin No. 228) I have found nine granites in which the zirconia is determined. The highest percentage was 0·08, and the others ranged from 0·04 downwards to a trace. Mr. Clarke in Bulletin No. 148, speaking of zircon, says of igneous rocks generally:—"It may rarely be present up to a few tenths of 1 per cent. of the rock." He also gives, as roughly approximate, that the average content of zirconia in igneous rocks is 0·03. This would imply a quantity of zircon adequate to account for barely 4 per cent. of the mean radium content of igneous rocks.

There are, probably, other radio-active minerals possessing an original store of uranium, but I think Mr. Strutt has shown good reason for believing that the chief radium carrier is the mica, at least in granites. This is a mineral which from its properties would be very likely to absorb and retain substances in solution. J. JOLY.

Trinity College, Dublin.

The Green Tints of Sunset.

THE appearance of a green light at sunset, like many other phenomena supposed to have only recently attracted attention, was noticed and commented upon by the ancient Egyptians, and more particularly so because in the clear air of Egypt the tints of sunset are peculiarly distinct.

As the sun there descends nearer and nearer to the horizon, apparently hastening to disappear behind one of the Libyan hills, as if burying itself in the sand at their base, the immensely enlarged flaming disc suddenly becomes, for an instant, of a brilliant green colour, and immediately a series of green rays suffuses the sky in many directions, well-nigh to the zenith.

The same phenomenon appears sometimes at sunrise, but to a smaller extent.

According to ancient Egyptian notions of cosmogony, the sun, after passing through the western gate into the world of night, travelled northward parallel to the Nile until the sixth hour, when it commenced to journey southward, having passed to the eastern side of Egypt, and, finally, at sunrise came forth by the "Gate of the East."

Now, during the nocturnal voyage, the solar orb was said to be a disc of Mafkait, which was the title of a green-coloured mineral, and so the sun was considered from sunset to sunrise to be coloured green. Sometimes, just as the last part of the sun's disc vanishes, its colour changes from green to blue, and so also after it has disappeared the sky near the horizon is often green, whilst toward the zenith it is blue. This was alluded to in ancient Egyptian writings, where sometimes it is said that at sunrise or sunset the sun's rays were of Tahen, a blue metal, the title of which is often used in reference to the blue of the sky.

In Egyptian thought day was the emblem of life and night that of death, and the nocturnal sun being identified with Osiris thus rendered Osiris the god of the dead. The setting sun being green, therefore Osiris, as the nocturnal deity of the dead, was on the monuments and representations of him when referred to as god of the dead painted green, as were other funerary divinities, such as Sekar, the form of the dead Ptah, which was that of a mummy with face and hands coloured green or dark blue. The splendid coffins of the high priests of Ammon, all the decorative tableaus of which are painted, frequently depict the green sun, and deities such as Anubis, god of the funerary journey, Isis, Nephtys, and Osiris are coloured green.

It may be interesting, if possible, to decide whether the Egyptians recorded their observation of the green colour at sunset in very early times. The late M. Groff, who has treated upon this point in the *Bulletin de l'Institut Egyptien*, proved that they did so as early as the fifth dynasty, by showing that a monument of that date delineates the half disc of the setting sun by a figure painted in three successive bands, the two lower, that is to say, those abutting on the horizon—of green, and the upper one of blue.

This is not the proper place to discuss the innumerable instances upon Egyptian relics of representations relative to death being coloured green. It is undoubtedly the case that the practice arose from the green tints of sunset and sunrise, but it may justifiably be said that in the green-coloured sun disc referred to, which dates 5000 years back, we have the, at present, earliest known human record of an astronomical phenomenon. JOSEPH OFFORD.

2 Fairfax Road, Bedford Park, W., January 29.

February and March Meteors.

FEBRUARY and March meteoric showers have never been sufficiently investigated. No very special displays have invited abundant observation, and, moreover, cold and cloudy weather often prevails at this season. Meteors, too, are generally rare, and from these several causes few observers have made persevering efforts to determine the strengths and positions of the radiants visible.

In 1877 and 1887, February–March, the writer at Bristol obtained some observations, but they were altogether insufficient to reveal more than a small minority of the meteoric streams of this period. Giuseppe Zezioli at Bergamo, and Lieut.-Colonel G. L. Tupman in the Mediterranean in 1867–71, effected many valuable observations in Febraury and March, and perhaps their results are the best secured up to the present time.

With the earth approaching aphelion, meteors are usually scarce, though there are a number of interesting showers visible, and fire-balls are invitingly plentiful. But the firmament not having been thoroughly watched during the latter part of the winter season, an earnest, persevering, and accurate observer has a very promising field before him, and may expect to discover more new showers than are likely to reward his vigils under summer and autumnal skies.

A number of streams presented during February and March have been already detected, but there is a large majority of very feeble systems still awaiting recognition. The visible strengths of many showers vary from year to year, and there are periodical displays which only occur at long intervals, so that fresh observations are very desirable if our knowledge is to keep pace with the developments frequently occurring.

Fireballs are often numerous on about February 10 and March 1–4. Some of the radiant points of ordinary shooting-stars recorded at Bristol are:—

February		March	
75°+41°	7–23rd	161°+58°	end
134+67	and in March	166+4	beginning
147+6		177+48	end
158+28		190+58	middle
175+10		196+44	
181+34	20th	229+32	end
204−10	13–21st	254+55	14th
236+11	13–20th	263+62	end
263+36	20th	270+47	middle
332+71		316+76	

Bristol, February 4. W. F. DENNING.

© 1907 Nature Publishing Group